



# Making LPG relevant in a highly disruptive market

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# ***The storm of disruption - where do we fit?***



# Four Pillars of Disruption

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## Ambitious Energy Efficiency

in all sectors leads to a halving of the energy intensity of the economy.



## Low Carbon Electricity

Low carbon electricity is supplied by renewable energy or a mix of renewable energy and either CCS or nuclear power at similar costs.



## Electrification and Fuel Switching

from fossil fuels to bioenergy, and from coal and oil to gas reduces emissions from transport, industry and buildings.



## Non-Energy Emissions

are reduced through process improvements and CCS in industry, while a profitable shift from livestock grazing to carbon forestry offsets any remaining emissions.

CCS



Source: ClimateWorks Australia & ANU, Pathways to Deep Decarbonisation in 2050

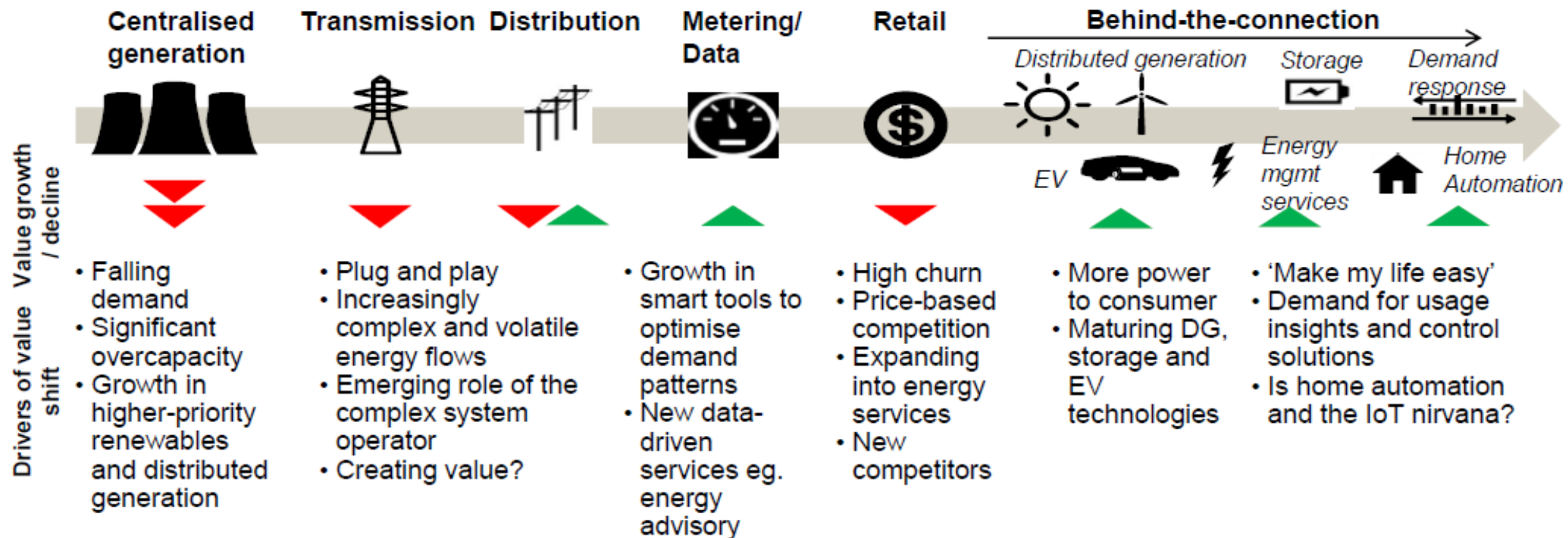


**Zero**



**Emissions**

## *The energy value chain is evolving - value and control shifting downstream, away from centralised generation*



Value is broadly shifting to behind-the-connection services and offerings





Please Explain?????

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Source: Adelaide Supply Crisis



# Trends in gas prices

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Gas price trend changes  
**2015 to 2017\***



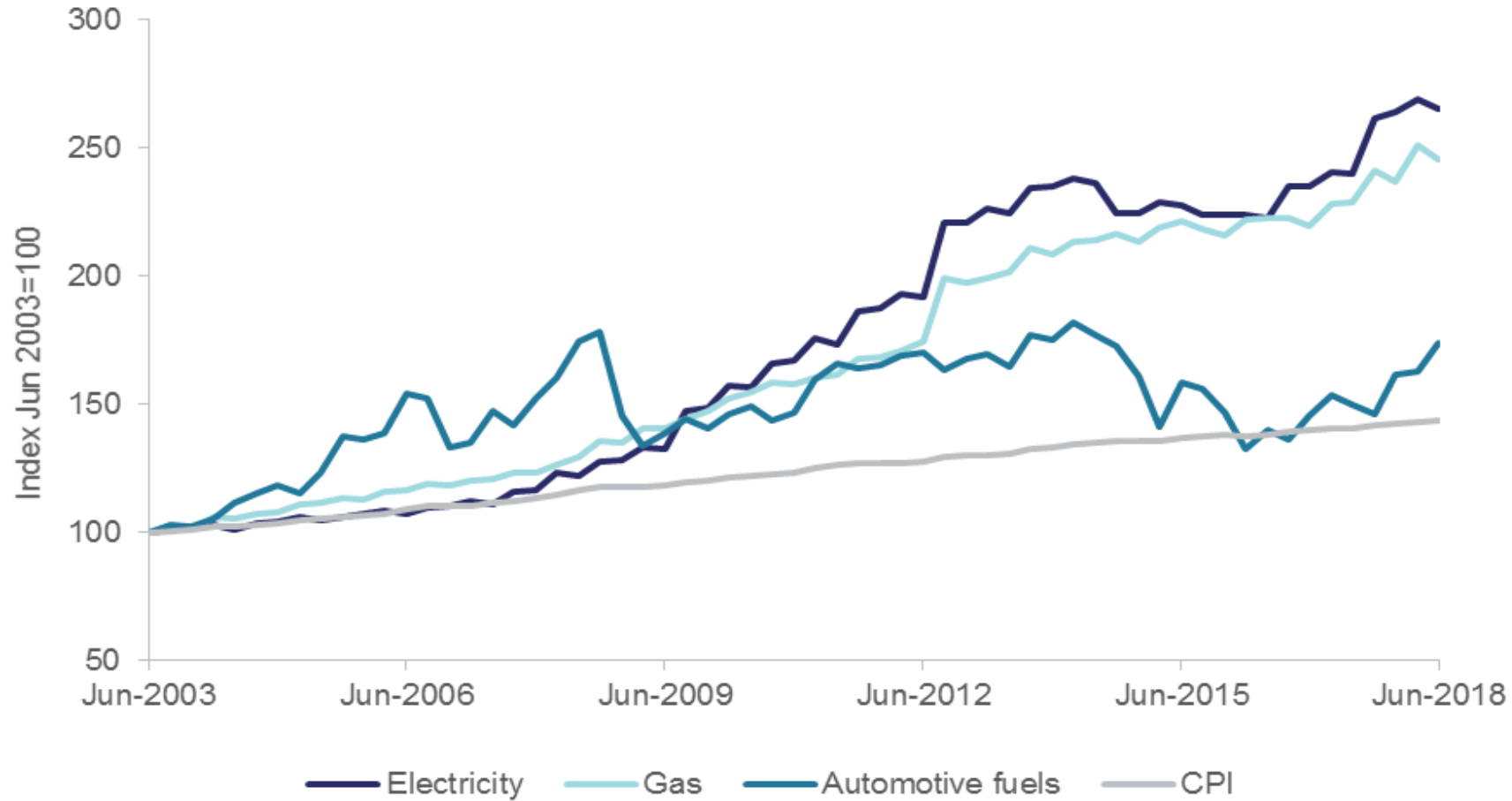
\* percentage change is difference between delivered gas prices year 2015 and year 2017 only.

Source: Oakley Greenwood Gas Price Trends Review 2017



# Qtly Energy Price Index

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Source: ABS Consumer Price Index 2018

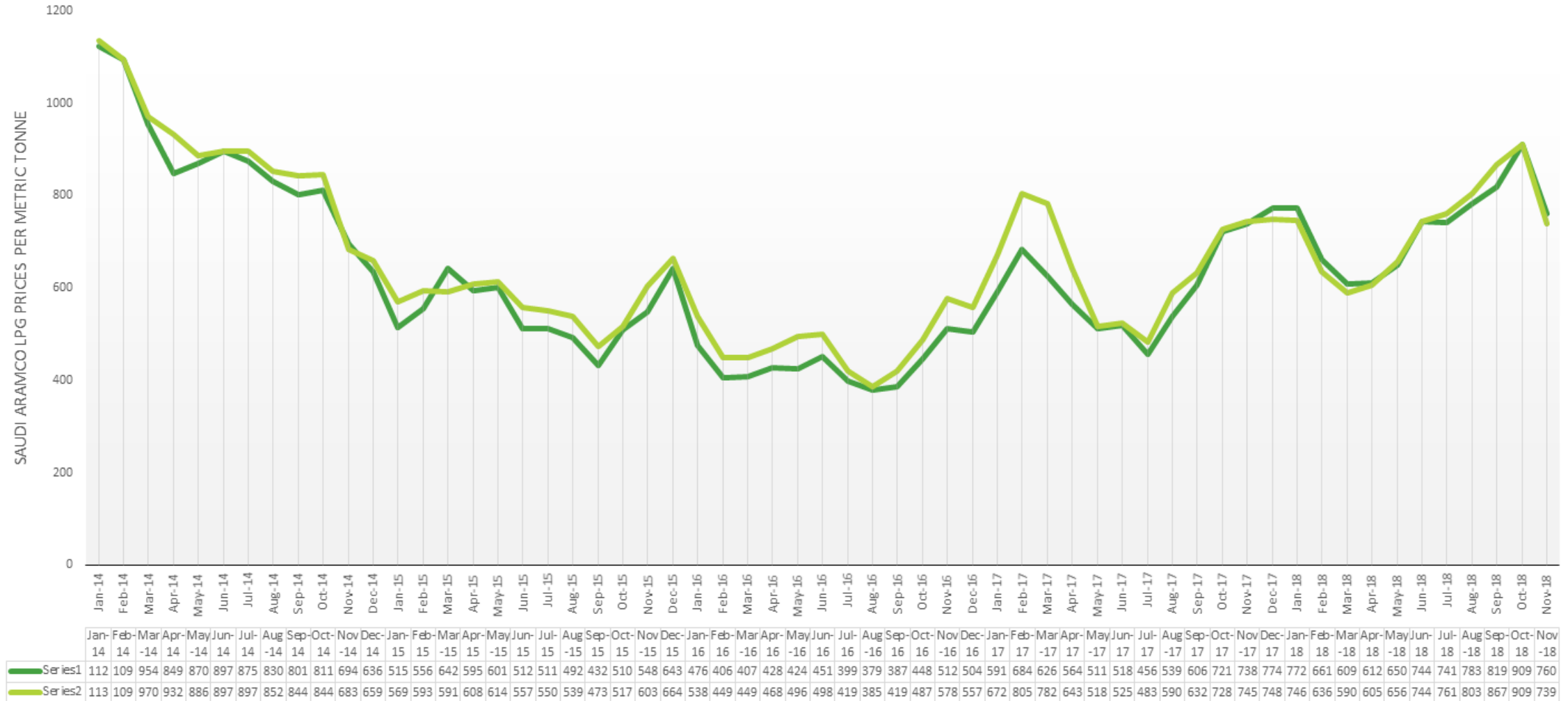




# Saudi Aramco Contract Prices

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Saudi Aramco Contract Prices



Source: Gas Energy Australia 2018



## Attitudes to energy prices for electricity and gas

Four key findings (Energy Consumer Sentiment Survey Dec 2017):

- Energy consumers think they get less “value for money” from electricity services than from insurance, banking, water, internet and mobile phone services.
- Energy consumers are not confident that the energy market is working in their interests.
- Consumers do not expect the outcomes from the energy market to improve in the future.
- Consumers are looking to demand side technologies (solar, storage, efficient appliances) to manage their energy costs.

From the ECCS:

- The number one consideration in all states was the purchase of “energy efficient appliances”
- Battery storage, Rooftop Solar, Solar Hot Water, Smart Energy systems were next considerations.
- Gas central heating, portable gas heaters were ranked as lower considerations across all states.

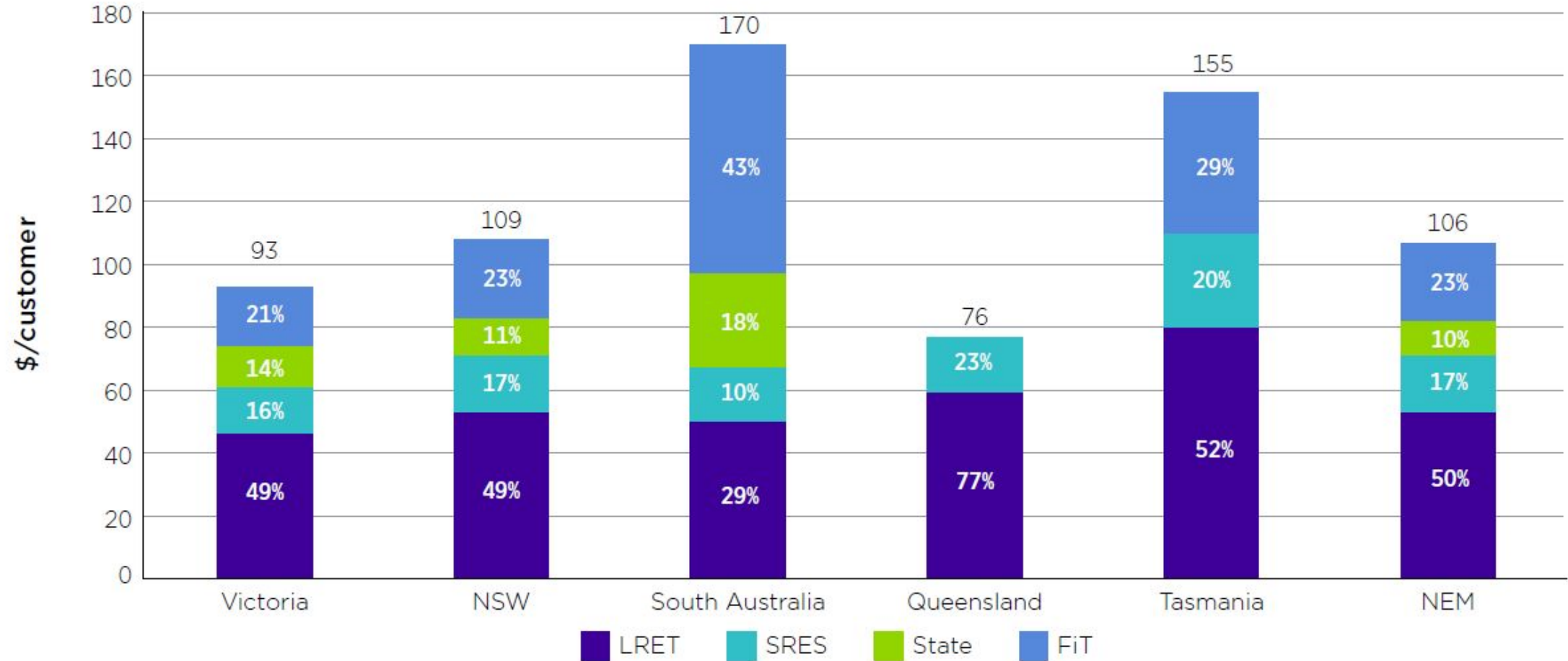
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SA



# Environmental costs

Figure E: Environmental costs in residential customer bills by state, 20017-18, real \$2016-17

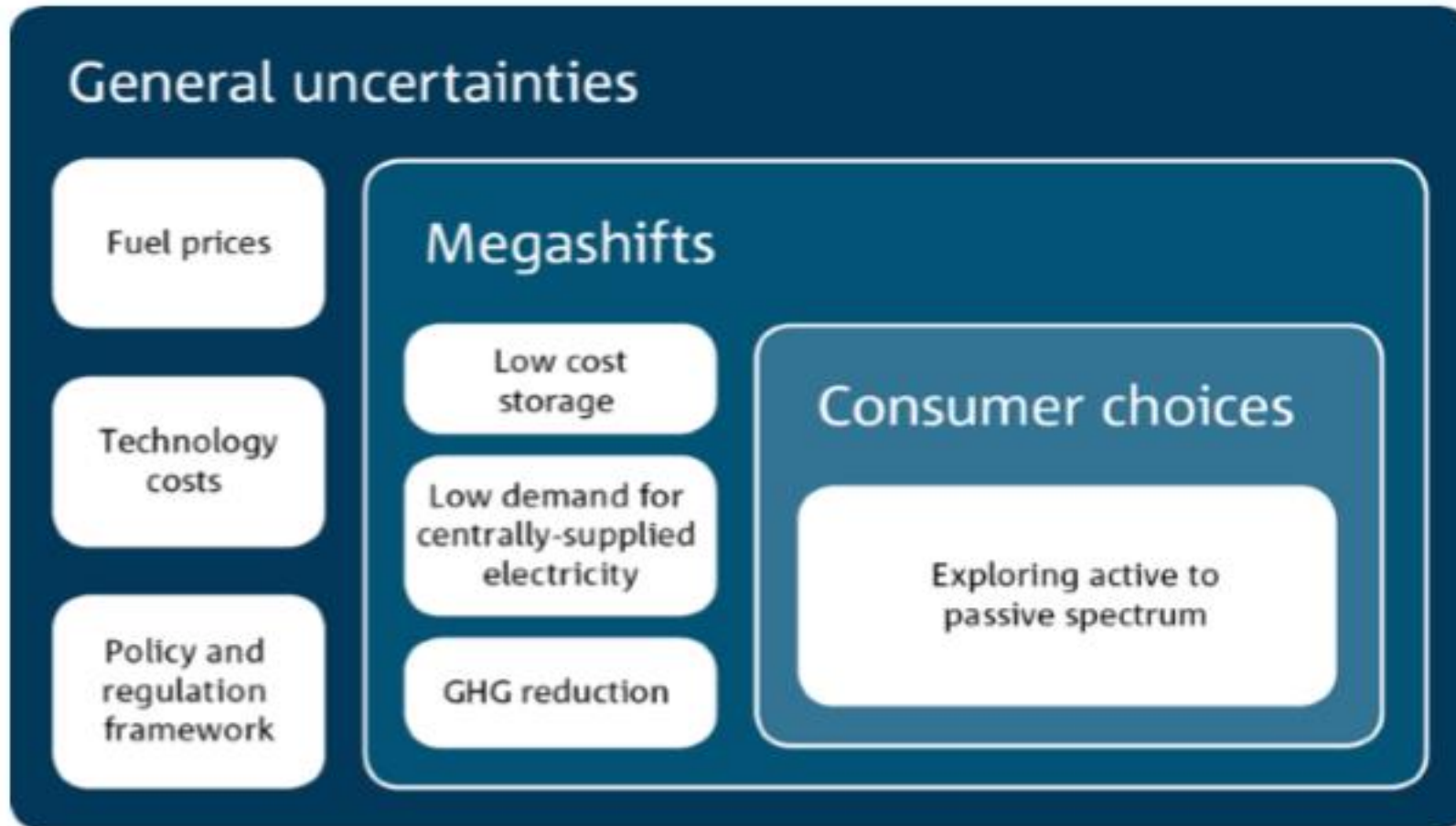


Source: ACCC –Retail Electricity Pricing Report June 2018



# Key challenges = Govt Intervention

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Source: Key challenges facing the Australian electricity system – Graham et al 2013



# Key challenges

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## AUSTRALIAN ENERGY MARKET COMMISSION NOTIFYING CUSTOMERS BEFORE THEIR ENERGY PRICES CHANGE Advance notice of price changes final determination 27 September 2018

Under this final rule, retailers must notify customers before their energy prices change. This helps prompt customers to take control of their electricity and gas bills.

### WHAT RETAILERS HAVE TO DO

Under the final rule retailers must:

Give customers at least five business days notice of price changes. The notice must set out the energy tariffs and charges that apply before and after the change, and the date of the price change.

Tell customers they can request their historical billing and energy usage data.

Deliver the notice by the customer's preferred method of communication, such as email, SMS or mail.

At least  
**5**  
business  
days notice

### BENEFITS

Customers:

Can switch earlier to a new plan or new retailer that better serves their needs, before price changes take effect.

Have more timely information to do other things that may help them save money, such as accessing their billing and usage data to work out how they can best manage the change in price.

Can more confidently participate in the energy market by being prompted to secure the best offer available or investigate energy efficiency tools and distributed generation like solar.

Advance notice gives customers time to change their budgeting plans or electricity usage if they want. They can also contact their existing retailer and negotiate a new retail plan to start right away.



### NEW CIVIL PENALTIES

The final determination includes a joint AEMC/AER recommendation for new civil penalties, such as fines, to protect customers if retailers fail to comply with the new obligations.



### WHERE THE NEW RULE APPLIES

The changes will be part of the National Energy Customer Framework (NECF) which applies in the ACT, Tasmania, South Australia, New South Wales and Queensland. The changes will not apply in Victoria as it has its own Energy Retail Code.

Queensland has a state law that requires retailers to notify customers on market offers at least ten business days in advance of price changes, which would still apply.

Also, the changes will not apply to customers in Tasmania, regional Queensland or the ACT who are on regulated electricity prices which are set by governments or regulators.



### NEXT STEPS

The rule will commence on 1 February 2019 to give retailers time to make changes to their systems.

Source: Australian Energy Market Commission





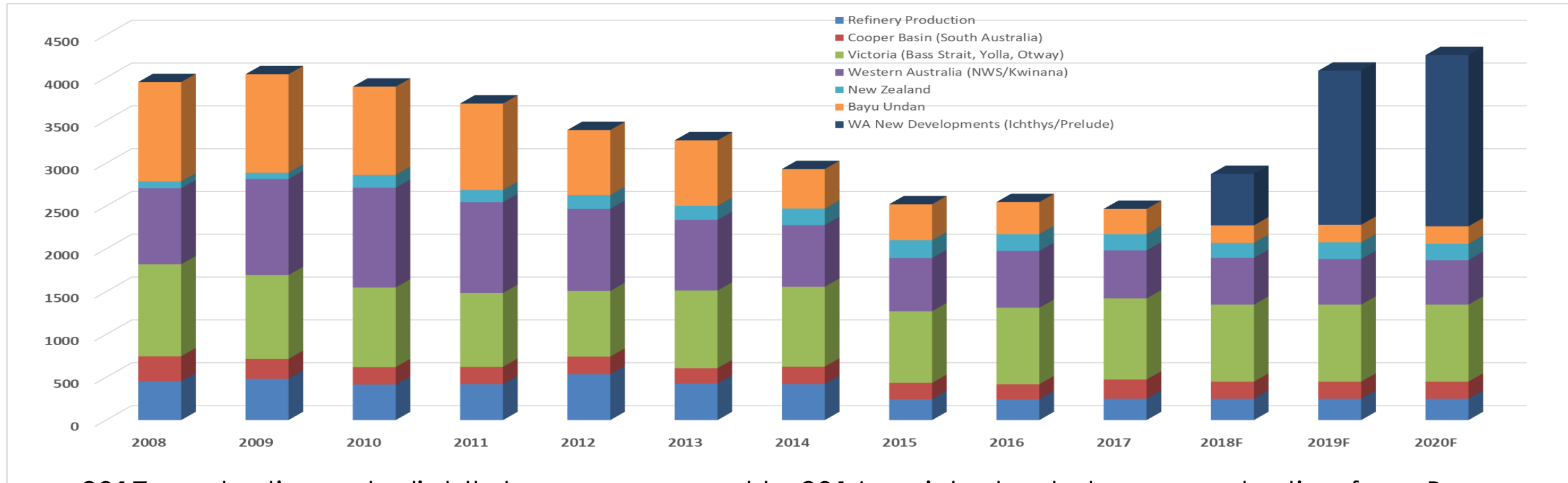
## LPG

The most  
unrecognised  
versatile, flexible  
energy fuel



# Australian LPG Production Outlook

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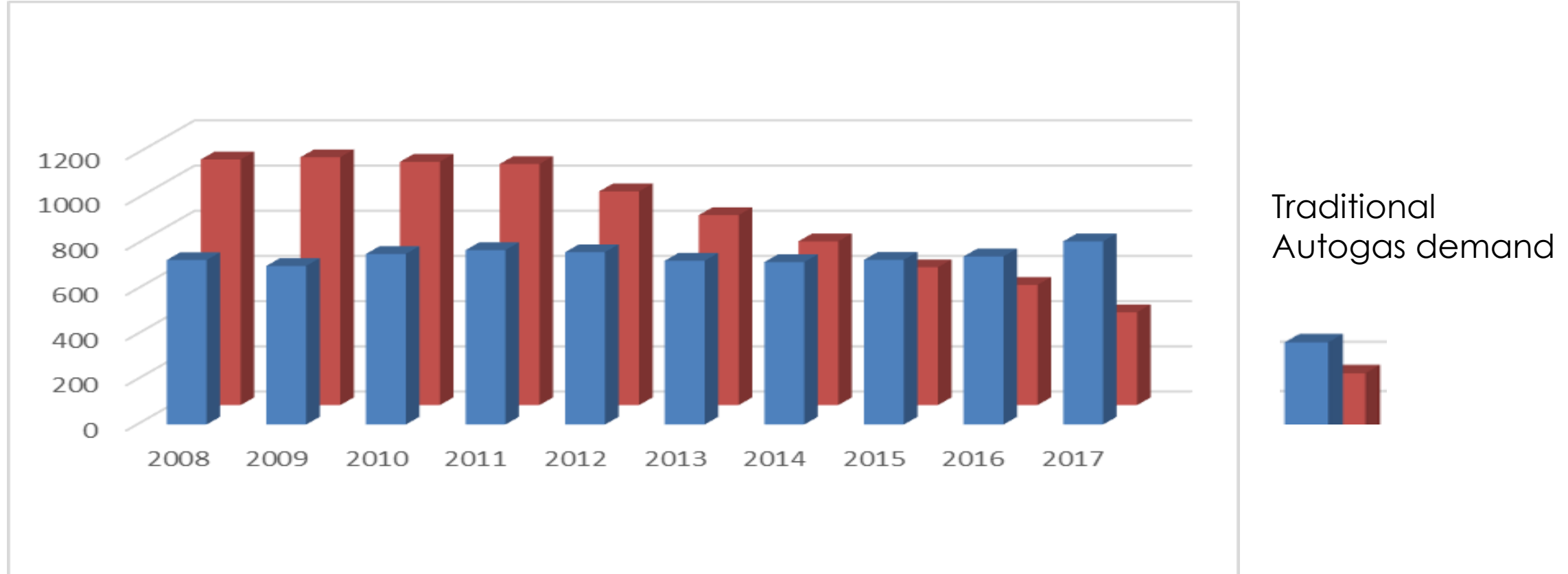
- 2017 production only slightly lower compared to 2016 mainly due to lower production from Bayu Undan (but higher production from the Cooper and Bass/Otway Basin)
- Production from new developments, Ichthys and Prelude, delayed further to Q3 and Q4 2018 respectively.

Source: LPG Supply and Demand Study - 2017, Gas Energy Australia; modified by Elgas



# Australian LPG Demand 2017

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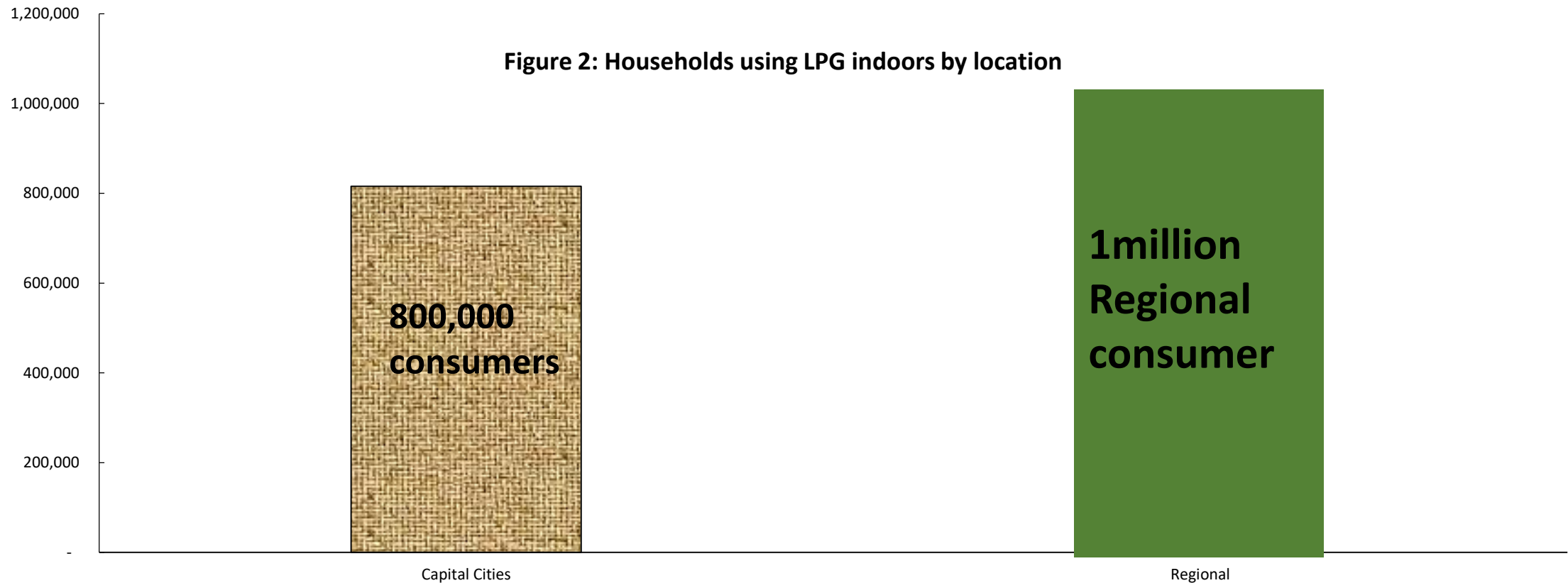


Source: LPG Supply and Demand Study - 2017, Gas Energy Australia; modified by Elgas



# Household use of LPG indoors

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Source: ABS energy use and conservation 2014





# LPG Storage & Distribution Capability

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Northern Territory  
1KT Storage

Darwin



North West Shelf  
61KT Storage

Dampier



Kwinana  
45KT Storage

Fremantle



South Australia  
72KT Storage

Pt Bonython

Altona  
Geelong

Westernport

Dandenong

Devonport

Cavern

Victoria 90KT Storage

Tasmania  
3KT Storage

Hobart

Sydney 69KT Storage

Surat Basin

Queensland 10KT  
Storage

Cairns

Townsville

Gladstone

Brisbane

Lytton

- Refinery
- LPG Export Terminals
- LPG Marine Receiving Terminals
- LPG Pipeline Receiving Terminal



**Over 350k tonnes  
Storage Capacity**







# Working with Renewables

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## Supporting renewable innovation

- Vast Solar is trialling its proprietary “concentrating solar thermal power” technology at its Jemalong Solar Station in Central NSW.
- Once ready for large scale implementation, the solar solution could deliver power pricing that is competitive with fossil fuels.
- LPG storage for ongoing power back-up.
- Brian Menzies, Vice President Commercial Development said:

*“We initially chose LPG because we needed a fast, controllable heat source for running thermal testing. We continue to use LPG today as a reliable back up fuel to support our plant operations.”*





# Versatility Supply Solutions

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## NSW-first LPG install for Kareela Village

- During a multi-million dollar refurbishment of Kareela Village, it was logistically difficult and expensive to connect to the local natural gas pipeline.
- Alternative 33 kilolitre underground LPG storage vessel, in-tank vaporiser and boiler.
- Restaurants and food outlets in the Sutherland Shire shopping hub are now using LPG for cooking and heating.
- Domenic Fiorenza, Facilities Manager at Kareela Village said:

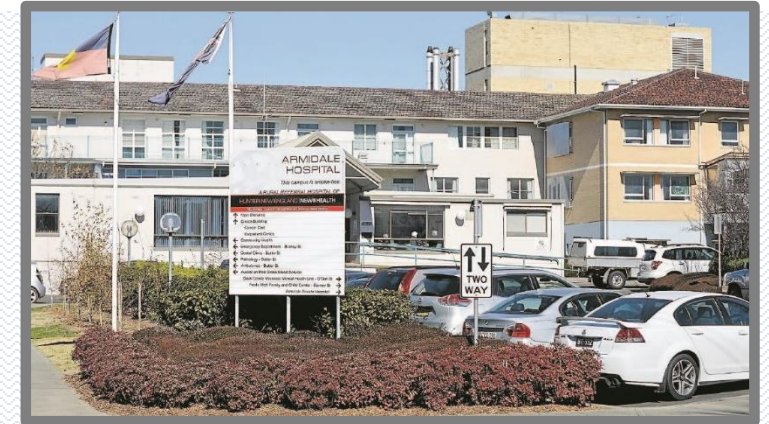
*"Our tenants are very happy with LPG because it offers better efficiency when it comes to cooking in commercial kitchens. There is very little fuss and that's a good thing - we don't need to call, they automatically come and refill the LPG so we have a reliable supply every day."*





## Simulated natural gas in Armidale

- LPG mixed with compressed air is Simulated Natural Gas (SNG) – an affordable natural gas alternative.
- 14km of reticulated pipeline supplying over 3,400 commercial and domestic properties in Armidale.
- Armidale Hospital has decommissioned its coal fired boiler in favour of SNG. SNG also supplies the University of New England.
- SNG is both a far more environmentally friendly and a more efficient fuel than coal.



	Gas	Coal	
Heat Capacity	50.1	29.93	GJ/tonne
Efficiency	85	73	%
CO2 per hour produced	87	137	kg

VIC

NSW



# Remote power generation potential



- Existing network of locations off the grid
- Transportation to location typically exists
- Opportunity to convert diesel gensets to LPG
- High cost of natural gas pipeline and access fees can make locations suitable for LPG
- Solar/LPG hybrid solution more green than solar/diesel solution
- LPG molecules store much longer compared to diesel



# On-grid electricity potential

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## Annual generation by fuel type

(2016/17):

100%  
196.5 TWh

77%  
150.9 TWh



COAL

9%  
17.6 TWh



GAS

8%  
15.5 TWh



WATER

5%  
10.6 TWh



WIND

0.3%  
0.6 TWh



SOLAR

0.7%  
1.3 TWh



OTHER

Data does not include generation from rooftop solar PV systems.

Source: AEMO



Wartsilla 14 MW Co- Gen Plant

Western Water



3MW (3units) Off Grid Origin





# Transport

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## Automotive



## Mid-Size



## Heavy Duty Dual Fuel





- Prixcar facility in Altona North
- Opened in July 2017
- Best practice for conversions
- Lowest cost target fleet market for volume
- Attractive value proposition
- LPG usage Taxi Hybrid 4cyl 2 tonnes per vehicle 130k P/a
- LPG usage Camry 4cyl 2 tonnes per vehicle 50k P/a

## *Move your fleet with Autogas*



**Smart Fleet Solutions  
Without Compromise...**  
*Via COE (Centre of Excellence)*



*Local vehicle manufacturing  
moving to import model*

*Technology ready meeting local and International  
emission requirements....*



*Victorian port of entry  
for Autogas systems*

*Seamless & cost effective logistics movement  
supporting dealer to customer...*



*Cleaner, cheaper  
& Convenient*

*Cost effective cleaner burning fuel compared to  
traditional motor spirits providing 80% reduction in  
particulate matter compared to Diesel engines*



*Fuelling Australia's  
Automotive future*

*There are approx 3,000 Autogas-enabled service  
stations around Australia. Vehicle operating systems  
software will maximise LPG usage*



# Freightliner 8L Propane S2 Chassis

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**Freightliner – Dedicated Propane 8.8 litre**

**ELGAS**





## Detailed route planning and logistical operation

- Total of 440,000 kilometres – over 55 round trips from Sydney to Darwin
- Delivered on-time and with zero safety incidents over a 10-week period
- The technology performed faultlessly validating its reliability without any issue







# HDDF Technology Trial

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Step forward to secure Australian compliance standard

- Elgas and Abmarc develop with the National Heavy Vehicle Regulator an Australian compliance standard to bring this technology to market
- Drivers reported the same power and torque when the truck was operating on LPG
- Substitution rates for LPG averaged 23 percent on an energy equivalent basis



VIC

3/13



*“Consumption is the sole end and purpose of all production [and regulation]; and the interest of the producer [and the regulator] ought to be attended to, only so far as it may be necessary for promoting that of the consumer.”<sup>3</sup>*

In other words, the moment after the moment of truth must only be defined with reference to promoting the interests of consumers — not producers and not regulators. Market disruption may upend almost everything we know, but there will be one exception. Consumers will still be there in the future.



## My Conclusion !!!

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**Consumer!!! Consumer!!!! Consumer**

➤ Meet consumer's Expectations

**Government**

➤ Remain relevant in the dialogue of zero emissions

**Technology**

➤ Adapt and drive new LPG technology